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ABSTRACT

The major objective of the project was to: assess the long-term impact of continuous educational stimulation on achievement of children entering the early education program at age 3 and continuing until age 9. A secondary objective was to: assess the long-term impact of continuous educational stimulation on behavior of children entering the program at age 3 and continuing until age 9. Comparisons of standardized test scores of children with 0,1,2, or 3 years of pre-primary experiences scored significantly higher on MRT, CTBS, and SAT than children without pre-primary experience. Initial differences between Control and Experimental groups were not overcome by end of grade 3. The Experimental children were characterized by: lack of fear of new situations, personnel, experiences, and materials; being "doers"- no non-participators; absence of learning disabilities or emotional problems traceable to the programs, and enjoyment of school attendance. Complaints were registered when school was closed for holidays. (Author)

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Final Report

Project No. 00684
Grant No. OEG-4-70-0045 (508)

Early and Continuous Stimulation of Children 3-9 Years of Age

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July 1972

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P r e f a c e

Although this report is the final report for Project Number 0-0684, Grant #OEG 4-70-0045 (508) from the Bureau of Research, USOE, it is in reality a continuation of a USOE Title III Grant # OEG 2-7-662355-0400, Project # 66-2355 to Clayton County, Georgia funded for the period 10-1-66 through 7-31-69.

The University of Georgia Research and Development Center in Educational Stimulation (R & D Center) -- also funded by a USOE Grant, worked cooperatively with the Clayton School System during the 1966-1970 period. Their assistance was financial and advisory in designing, initiating, and operating the program during the period from 1966 through June, 1970.

INTRODUCTION

In September, 1966 the Clayton County Board of Education in cooperation with the University of Georgia Research and Development Center in Educational Stimulation (R & D Center) initiated an early childhood educational program in the Suder School, Jonesboro, Georgia. The project included 60 children 2 years 9 months through 3 years 8 months of age, 60 children 3 years 9 months through 4 years 8 months of age, and 60 children 4 years 9 months through 5 years 8 months of age. These children comprised a cross section of the Clayton County population with regard to age, sex, ethnic group, intelligence, and socio-economic status.

The composition of the groups and teaching teams is described as follows:

> The instructional groups were comprised of 10 groups of 18 pupils each, 5 meeting from 8:30 to 11:00 mornings, and 5 meeting from 12:00 to 2:30 afternoons, 4 days each week. Each of the 10 instructional groups was a composite of three sub-groups composed of children whose intelligence quotients were within a range which differed substantially from the other two. Chronological age range within each age group was limited generally to 24 months.
>
> All of the five teaching teams were composed of head teacher, assistant teacher, and teacher aide. These team members worked together in providing educational opportunities which included both individual, small, and large group activities. Educational stimulation in some measure was provided the children in the areas of reading, mathematics, literature, music, art, rythm, science, social studies, health, safety, and physical education. The materials for instruction were especially selected or developed by professors and research assistants at the R & D Center. These structured materials were designed with the objective of providing experiences which would facilitate continuous progress for each child. Schedules of each classroom remained flexible to the point that new units of activities to promote student progress could be introduced when needed. (Powell, 1968)

In the Fall of 1967 sixty (60) 3-year olds were selected as an additional beginning group. The students previously enrolled were advanced to the next higher age group. In addition, students were assigned to heterogeneous age groups. An attempt was made to assure that each group was basically similar with regard to age, sex, ethnic group, socio-economic status, and verbal ability. The primary reason for changing

from a multiple to single age groups was to conform to the legal age requirements for children entering first grade.

In the Fall of 1968 seventy-five (75) 3-year olds were selected for the beginning class. This was to assure a lager at the completion of the project. The last 3-year old beginning class of 3-year olds was enrolled in September, 1969.

In September, 1969 the teaching teams were changed so that each team was comprised of a teacher and two teacher aides instead of teacher, assistant teacher, and teacher aide. From an administrative standpoint, this was a much easier arrangement to supervise. The assistant teachers often felt as if they were treated as an aide and not as an assistant teacher. This feeling brought about considerable resentment. The teacher aides accepted their role as an aide without resenting the teacher's dominance.

During the Summer of 1969 sixty (60) children scheduled to enter first grade in September in Clayton County Schools were selected to serve as a Control Group for the first group of pre-primary children ready for first grade after three years of pre-primary experience. The same criteria were used to select the Control as were used to select the Experimental Group; i.e., age, sex, socio-economic status, intelligence quotients (Stanford Binet and Peabody Picture Vocabulary), and ethnic group. A comparison of Stanford Binet Scores of Control and Experimental groups based on 1970 administrations of the Stanford Binet revealed that the intelligence quotients of the two groups were not significantly different.

Both Control and Experimental children were assigned to first grade classrooms with 20 children taught by teacher and teacher aide. Experimental and Control children were assigned to classrooms on a heterogeneous basis. These children were not mixed, i.e., Control children were placed in classrooms with other Control children and Experimental children were placed with other Experimental children. This procedure continued throughout the period of the project.

All of the children, Control and Experimental, had access to the same meterials and instructional procedures, limited only by the capacity of the children involved to handle concepts and materials satisfactorily. Staff members were alert for signs of frustration or boredom. When such signs were discovered, an attempt was made to steer the child into activities more suitable for him.

Beginning with the Fall of 1967 there was an Experimental first each year through September 1971. The class of 1967 had one year of pre-primary experience, the class of 1968 two years, and the classes of 1969, 1970, and 1971 three years of pre-primary experience prior to first grade.

The major objective of the early educational stimulation project was to: assess the long-term impact of continuous educational stimulation on achievement of children entering the early education program at age 3 and continuing until age 12. Due to loss of funding, the period was reduced to include ages 3 through 9---completion of third grade.

A secondary objective was to: assess the long-term impact of continuous educational stimulation on behavior of children entering the program at age 3 and continuing until the age of 9.

The University of Georgia R & D Center's source of funding was lost in June, 1970. The Clayton County Board of Education applied for a two-year phasing out grant from the Bureau of Research. The project proposal was approved and funded for the period August, 1970 through June, 1972. This is the Final Report of the two-year grant.

Procedures

The Metropolitan Readiness Test((MRT) Harcourt, Brace, and World, Inc., 1965) was administered each year in September to each beginning Experimental first grade. The MRT was also administered in September 1969 to the beginning Control first grade. (Children with no pre-primary experience.) Mean raw score differences between Experimental children with 1, 2, and 3 years of pre-primary experience were test for significance by a t test of significance outlined by Garrett (1962). Tests of significance were also made for mean raw score differences of the 1969 Control and 1969 Experimental first grades. See Tables 1-3, Appendix.

The Experimental Class of 1971 total mean (MRT) scores were compared to total mean (MRT) raw scores of beginning first grade children of selected elementary schools in Clayton County. See Table 4, Appendix. These schools were judged to be representative of Clayton County schools with regard to student composition. Included in this group was a school serving children from families with the highest median income of any community in Clayton County, a school with a high percentage of children from a subsidized housing development, a school with a comparatively high percentage of minority students, and a school with an all white student body.

Stanford Achievement Tests, Primary II (Harcourt, Brace, and World, Inc., 1964) were administered to each Experimental class in May of the year they completed third grade. These tests were also administered to the Control class in May of 1972, as they were completing third grade. Mean raw score differences of children with 0, 1, 2, 3 years of pre-primary experience were tested for significance by a t test as outlined by Garrett (1962). See Tables 5-10, Appendix.

Comprehensive Test of Basic Skills (CTBS), Level I (California Test Bureau, 1968) were administered to Experimental classes of 1967, 1968, and 1969 in October of 1969, 1970 and 1971, i.e., as each class was beginning the third grade. The CTBS was administered to the Control Class in October, 1971.

Mean grade equivalent score differences of children with o, 1, 2, and 3 years of pre-primary experience were tested for significance as outlined by Garrett (1962). See Tables 11-14.

Mean CTBS grade equivalent score differences between the Experimental class of 1967 and third grade students in selected Clayton County elementary schools were tested for significance. See Tables 15-19, Appendix.

Mean CTBS grade equivalent score differences between the Experimental class of 1968 and third grade students in selected Clayton County Schools were tested for significance. See Tables 19-22, Appendix.

CTBS scores were not available for the selected Clayton County Schools for comparison with the Experimental class of 1969.

The Wray Behavior Scale (R & D Center, University of Georgia, 1968) was administered to each Experimental class at least once. A judgement by project staff to the effect that the scale did not adequately point up behaviorial differences resulted in this part of the evaluation being omitted from final evaluations.

Results

Metropolitan Readiness Tests: There were no significant differences between total raw scores of children entering first grade with 1 or 2 years of pre-primary experience. See Table 1, Appendix.

Significant differences at the .025 and .05 levels in favor of the children with three years of pre-primary experience when compared to children with one or two years of pre-primary experience, respectively. Total mean raw scores of children with three years of pre-primary experience were significantly higher than those with 0 years of pre-primary experience (Control class). The level of significance was at the .0005 level. There were no significant differences between total mean raw scores on MRT of the three classes (1969, 1970, and 1971) of children with three years of pre-primary experience prior to first grade entry. See Tables 2 and 3, Appendix.

A Comparison of total mean MRT scores of the Experimental class of 1971 with total mean scores of beginning first grade children from selected elementary schools in Clayton County revealed significant differences in favor of the Experimental class at the .005 or .0005 levels. The children from the two schools scoring closest to the Experimental class administered the MRT two weeks later than the other schools, including the Experimental class. See Table 4, Appendix.

Stanford Achievement Tests (SAT): A comparison of SAT mean sub-test raw scores of the classes of 1967 and 1968 (one and two years in pre-primary, respectively) revealed that there were no significant differences in any sub-test area. Tests were administered at the end of the third grade. See Table 5, Appendix.

When mean SAT sub-test raw scores of Experimental class of 1967 and Experimental class of 1969 were compared, there were significant differences in the Class of 1969 in the areas of paragraph meaning, spelling, word study skills, and language. There were no significant differences between the groups in the areas of word meaning, science and social studies concepts, arithmetic computations, and arithmetic concepts. See Table 6, Appendix.

When the mean SAT sub-test scores of the Experimental Class of 1969 and Experimental Class of 1968 were compared, there were significant differences in favor of the Experimental Class of 1969 in the areas of paragraph meaning and arithmetic computations. See Table 7, Appendix.

There were significant differences (in all sub-test areas) in favor of the Experimental Class of 1969 with mean sub-test scores of the Control Class of 1969. See Table 8, Appendix.

When mean sub-test SAT scores of the Control Class of 1969 were compared to mean sub-test scores of the Experimental Classes of 1967 and 1968, there were significant differences in favor of the Experimental Classes in all sub-test areas except the areas of spelling and paragraph meaning for class of 1967 and in the area of spelling for class of 1968. See Tables 9 and 10, Appendix.

Comprehensive Tests of Basic Skills: Tables 11, 12 13, and 14 (See Appendix) compare third grade equivalency scores of children with 0, 1, 2 or 3 years of pre-primary experience school prior to beginning first grade. Findings indicate that children with 2 years of pre-primary experience scored significantly higher in the areas of Language Spelling, Arithmetic Computations, Arithmetic Total, and Total Battery than children with 1 year of pre-primary experience. (Table 11, Appendix)

Children with 3 years of pre-primary experience scored significantly higher in Language Total, Arithmetic Computations, Arithmetic Total, and Battery Total than children with 1 year of pre-primary experience. (Table 12, Appendix)

There was no significant difference in any area between scores of children with 3 years and those with 2 years of pre-primary experience. (Table 13, Appendix)

Children with 3 years of pre-primary experience scored significantly higher in all areas than those with no pre-primary experience. (Table 14, Appendix)

A comparison of Arnold Experimental (third grade) CTBS scores of children with 1 and those with 2 years of pre-primary experience with the CTBS scores of third grade children from representative Clayton County Schools (those judged a cross section of all schools in the County) revealed that the children with pre-primary experience scored significantly higher in Total Reading, Total Language, Total Arithmetic, and Battery Total. (Tables 15-22, Appendix)

Conclusions and Observations

The following conclusions seem warranted from the test data:

1) Children with pre-primary experience scored significantly higher on the MRT, CTBS, and SAT than children with no pre-primary experience.

2) From the standpoint of net achievement it would be difficult to prove the value of 3 years of pre-primary experience over 1 or 2 years of pre-primary experience; however, pre-primary experience seems to have made a difference in test performance at the beginning of first grade, at the beginning of third grade, and at the end of third grade.

Although there is no test data to support the following observations, they are supported by staff consensus and are held to be more valuable than findings based solely on test data.

The children did not fear new situations, materials, experiences, or new personnel. On the contrary, they seemed to welcome new experiences and were all "doers". No one was a non-participant. Even the slower ones were able to be an active part of the learning environment provided.

There were children with learning disabilities (discovered after admission) but in no instance did an emctional or learning problem develop traceable to the program. Staff members were able to work with students on an individualized basis to a point that frustrations from inappropriate experiences were minimized.

Children enjoyed school attendances. In fact, parents reported to us that some of the children complained when school was dismissed for holidays. This seems to support the opinion that school was a gratifying experience. Generally speaking, the human animal avoids unpleasant experiences.

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APPENDIX

Tables

Table 1

Means, Standard Deviations, Standard Error of Mean Difference, Degrees of Freedom, and Significance Values (t tests) for Total Raw Scores on Metropolitan Readiness Test of Classes of 1967 and 1968*

CLASS OF:	N	X	SD	$X_{68}-X_{67}$	SEM_D	df	t	P
1967	47	63	15.38					
1968	50	65	12.17	2	2.83	95	.71	NS***

* Class of 1967: Students with 1 year of pre-primary experience

* Class of 1968: Students with 2 years of pre-primary experience

*** Not Significant

Table 2

Means, Standard Deviations, Standard Error of Mean Difference, Degrees of Freedom, and Significance Values (t tests) for Total Raw Scores on Metropolitan Readiness Tests of Classes of 1967, 1968, 1969, 1970, and 1971*

CLASS OF:	N	$\bar{X}$	SD	$\bar{X}_1-\bar{X}_{2-6}$	SEM_D	df	t	P
1967 (2)	47	63	15.38	6	2.80	95	2.14	.025
1968 (3)	50	65	12.17	4	2.40	98	1.67	.05
1969 (E) (1) Experimental	50	69	11.91	--	--	--	--	--
1969 (C) (4) Control	60	57	18.09	12	2.88	108	4.17	.0005
1970 (5)	50	70	9.62	1	2.16	98	.46	NS**
1971 (6)	60	69	9.29	0	2.06	108	0	NS

*Class of 1969--Experimental--children with 3 years of pre-primary experience (Group used as comparison group for other classes above)
Class of 1969--Control-children without pre-primary experience
Classes of 1967, 1968, 1970 and 1971--students with 1, 2, and 3 years of pre-primary experience, respectively

**NS Not Significant

Table 3

Means, Standard Deviations, Standard Error of Mean Difference, Degrees of Freedom, and Significance Values (t Scores) for Mean Raw Scores on Metropolitan Readiness Test Scores of Arnold Experimental and Control Students, Class of 1969*

Variable	EXPERIMENTAL X	N	SD	CONTROL X	N	SD	$X_E - X_C$	SEM_D	df	t	p
Word Meaning	10	50	2.45	9	60	3.04	1	.52	108	1.92	.05
Listening	11	50	2.35	10	60	2.54	1	.47	108	2.12	.025
Matching	10	50	3.17	7	60	4.07	3	.69	108	4.34	.0005
Alphabet	14	50	2.06	11	60	4.97	3	.76	108	3.95	.0005
Numbers	16	50	4.06	13	60	5.30	3	.92	108	3.27	.005
Copying	8	50	2.54	7	60	3.23	1	.55	108	1.81	.05
Total	69	50		57	60	18.09	12	2.88	108	4.51	.0005

* Class of 1969--Experimental--Children with three years of pre-primary experience
Control--Children without pre-primary experience
(Groups were selected by same criteria and entered first grade in 1969)

Table 4

Means, Standard Deviations, Standard Error of Mean Difference, Degrees of Freedom, and Significance Values (t tests) for Total Mean Raw Scores on Metropolitan Readiness Test of Arnold Experimental First Grade and Selected First Grades in Clayton County, Fall of 1971*

School	N	X	SD	X_1-X_{2-13}	SEM_D	df	t	P
ARNOLD (Experimental)	60	62	9.29					
ARNOLD (Control)	22	51	20.09	18	4.44	80	4.05	.0005
HUIE	124	64**	15.66	5	1.84	182	2.71	.005
MORROW	73	54	14.62	15	2.09	133	7.18	.0005
SUDER	171	57	15.73	12	1.69	229	7.10	.0005
LEE STREET	107	54	17.16	15	2.04	165	7.25	.0005
RIVERDALE	165	57	14.86	12	1.66	223	7.23	.0005
ANDERSON	82	61**	18.45	8	2.36	128	3.07	.005
HENDRIX	94	52	18.32	17	2.41	161	7.05	.0005
EDMONDS	100	56	16.78	13	2.01	167	6.46	.0005
NORTH JONESBORO	69	56	16.44	13	2.31	127	5.62	.0005
WEST CLAYTON	130	54	15.70	15	1.82	158	8.24	.0005
SWINT	165	51	18.55	18	1.87	223	9.64	.0005

*Arnold Experimental-1;Arnold-Control 2;Huie-3;Morrow;4;Suder-5;Lee Street-6; Riverdale-7;Anderson-8;Hendrix-9;Edmonds-10;North Jonesboro-11;WestClayton-12 Swint-13

** Tests administered up to two weeks later than administered to other students in study

Table 5

Means, Standard Deviations, Standard Error of Mean Difference, Degrees of Freedom, and Significance Values (tests) for sub-tests of Stanford Achievement Tests, Primary II for Experimental Classes of 1967 and 1968*

	Class of 1967			Class of 1968			$X_{68}-X_{67}$	SEM_D	df	t	P
	N	X	SD	N	X	SD					
Word Meaning	47	26	6.58	48	27	6.53	1	1.34	93	.75	NS**
Paragraph Meaning	47	40	11.76	48	41	13.16	1	2.56	93	.39	NS
Science & Social Studies Concepts	47	25	4.15	48	26	4.20	1	.85	93	1.18	NS
Spelling	47	20	7.44	48	22	6.77	2	1.46	93	1.37	NS
Word Study Skills	47	48	10.02	48	51	10.88	3	2.15	93	1.40	NS
Language	47	47	9.53	48	50	9.89	3	1.99	93	1.51	NS
Arithmetic Computations	47	44	6.69	48	42	8.22	2	1.54	93	1.30	NS
Arithmetic Concepts	47	34	8.67	48	34	8.70	0	1.77	93	0	NS

*Class of 1967: Children with one year of pre-primary experience, Tested 5/70

Class of 1968: Children with 2 years of pre-primary experience, Tested 5/71

**Not Significant

Table 6

Means, Standard Deviations, Standard Error of Mean Difference, Degrees of Freedom, and Significance Values (t tests) for sub-tests of Stanford Achievement Tests, Primary II for Experimental Class of 1969 and Class of 1967*

	Class of 1969			Class of 1967			$X_{69}-X_{67}$	SEM_D	df	t	P
	N	X	SD	N	X	SD					
Word Meaning	33	28	4.87	47	26	6.58	2	1.28	78	1.56	NS**
Paragraph Meaning	33	45	7.90	47	40	11.76	5	2.19	78	2.28	$<.025$
Science and Social Studies Concepts	33	26	4.89	47	25	4.15	1	1.09	78	.91	NS
Spelling	33	24	5.14	47	20	7.44	4	1.40	78	2.85	$<.005$
Word Study Skills	33	53	8.35	47	48	10.02	5	2.06	78	2.43	$<.01$
Language	33	51	9.50	47	47	9.53	4	2.16	78	1.85	$<.05$
Arithmetic Computations	33	46	5.85	47	44	6.69	2	1.40	78	1.43	NS
Arithemtic Concepts	33	34	8.04	47	34	8.67	0	1.88	78	0	NS

*Class of 1969: Children with three years of pre-primary experience, Tested 5/72

Class of 1967: Children with 1 year of pre-primary experience, Tested 5.70

**NS - Not Significant

Table 7

Means, Standard Deviations, Standard Error of Mean Difference, Degrees of Freedom, and Significance Values (t tests) for sub-tests of Stanford Achievement Tests, Primary II for Experimental Class of 1969 and Class of 1968*

	Class of 1969			Class of 1968			$X_{69}-X$	SEM_D	df	t	P
	N	X	SD	N	X	SD					
Word Meaning	33	28	4.87	46	27	6.53	1	1.28	77	.78	NS**
Paragraph Meaning	33	45	7.90	46	41	13.16	4	2.37	77	1.69	.05
Science and Social Studies Concepts	33	26	4.89	46	26	4.20	0	1.05	77	0	NS
Spelling	33	24	5.11	46	22	6.77	2	1.34	77	1.49	NS
Word Study Skills	33	53	8.35	46	51	10.88	2	2.16	77	.93	NS
Language	33	51	9.50	46	50	9.89	1	2.20	77	.45	NS
Arithmetic Computations	33	46	5.85	46	42	8.22	4	1.58	77	2.53	.01
Arithmetic Coneepts	33	34	8.04	46	34	8.70	0	2.38	77	0	NS

*Class of 1969: Children entering first grade with 3 years of pre-primary experience Tested 5/72

**Class of 1968: Children entering first grade with 2 years of pre-primary experience Tested 5/71

Table 8

Means, Standard Deviations, Standard Error of Mean Difference, Degrees of Freedom, and Significance Values (t tests) for sub-tests of Stanford Achievement Tests, Primary II for Experimental and Control Third Grade students at Arnold Elementary (Class of 1969)

Variable	EXPERIMENTAL*			CONTROL**			$X_E - X_C$	SEM_D	df	t	P
	N	X	SD	N	X	SD					
Word Meaning	33	28***	4.87	38	22***	8.60	6	1.63	71	3.68	<.0005
Paragraph Meaning	33	45	7.90	38	35	15.73	10	2.89	71	3.46	<.0005
Science & Social Studies Concepts	33	26	4.89	38	22	4.66	4	1.13	71	3.54	<.0005
Spelling	33	24	5.14	38	19	9.78	5	1.82	71	2.75	<.005
Word Study Skills	33	53	8.35	38	40	15.19	13	2.86	71	4.55	<.0005
Language	33	51	9.50	38	42	10.14	9	2.71	71	3.32	<.005
Arithmetic Computations	33	46	5.85	38	32	9.61	14	1.86	71	7.53	<.0005
Arithmetic Concepts	33	34	8.04	38	27	11.50	7	2.33	71	3.00	<.005

*Experimental, Class of 1969: Children entering first grade in 1969 with 3 years of Pre-primary experience, Tested 5/72

**Control, Class of 1969: Comparable children entering first grade in 1969 without Pre-primary experience, Tested 5/72

***Raw Scores

Table 9

Means, Standard Deviations, Standard Error of Mean Difference, Degrees of Freedom, and Significance Values (t tests) for sub-tests of Stanford Achievement Tests, Primary II for Control Class of 1969 and Class of 1967*

	Class of 1969			Class of 1967			$X_{69}-X_{67}$	SEM_D	df	t	P
	N	X	SD	N	X	SD					
Word Meaning	38	22	6.58	47	26	6.58	4	1.69	83	2.37	.025
Paragraph Meaning	38	35	15.73	47	40	11.76	5	3.07	83	1.63	NS**
Science & Social Studies Concepts	38	22	4.66	47	25	4.15	3	.94	83	3.19	.005
Spelling	38	19	9.78	47	20	7.44	1	1.92	83	.52	NS
Word Study Skills	38	40	15.19	47	48	10.02	8	2.86	83	2.80	.005
Language	38	42	10.14	47	47	9.53	5	2.15		2.33	.025
Arithmetic Computations	38	32	9.61	47	44	6.69	12	1.85		6.48	.0005
Arithmetic Concepts	38	27	11.50	47	34	8.67	7	3.48		2.01	.025

*Class of 1969: Children completing third grade without pre-primary experience Tested 5/72

Class of 1967: Children with 1 year of pre-primary experience Tested 5/70

**Not Significant

Table 10

Means, Standard Deviations, Standard Error of Mean Difference, Degrees of Freedom, and Significance Values (t tests) for sub-tests of Stanford Achievement Tests, Primary II for Control Class of 1969 and Class of 1968*

	Class of 1969			Class of 1968			$X_{69}-X_{68}$	SEM_D	df	t	P
	N	X	SD	N	X	SD					
Word Meaning	38	27	8.60	46	27	6.53	5	1.67	82	2.99	.005
Paragraph Meaning	38	35	15.73	46	41	13.16	6	3.20	82	1.88	.05
Science & Social Studies Concepts	38	22	4.66	46	26	4.20	4	.97	82	4.12	.0005
Spelling	38	19	9.78	46	22	6.77	3	1.87	82	1.60	NS**
Word Study Skills	38	40	15.19	46	51	10.88	9	2.94	82	3.06	.005
Language	38	42	10.14	46	50	7.89	8	2.01	82	3.98	.0005
Arithmetic Computations	38	32	9.61	46	42	8.22	10	1.97	82	5.08	.0005
Arithmetic Concepts	38	27	11.50	46	34	8.70	7	2.26	82	3.10	.005

*Class of 1969: Children completing third grade without pre-primary experience
Tested 5/72

Class of 1968: Children with 2 years of pre-primary experience
Tested 5/71

**Not Significant

TABLE II

Means, Standard Deviations, Standard Error of Mean Difference, Degrees of Freedom, and Significance Values (t tests) for Arnold Experimental Third Grade* on Sub-tests and Total Battery Grade Equivalency Scores on Comprehensive Tests of Basic Skills, Level I

Variable	Arnold * 1968 N	X	SD	Arnold ## 1967 N	X	SD	X* - X**	SEM_D	df	t	P
Reading Vocabulary	47	3.77	1.43	48	3.38	1.22	.39	.53	95	.07	NS
Reading Comprehension	47	4.14	1.36	48	4.08	2.01	.04	.35	95	.01	NS
Reading Total	47	3.88	1.26	48	3.59	1.40	.29	.27	95	1.07	NS
Language Mechanics	47	4.12	1.46	48	3.76	1.18	.36	.27	95	1.33	NS
Language Expression	47	3.96	1.57	48	3.88	1.84	.08	.37	95	.22	NS
Language Spelling	47	4.14	1.62	48	3.55	1.21	.59	.29	95	2.03	.025
Language Total	47	3.97	1.28	48	3.62	1.23	.35	.25	95	1.40	NS
Arithmetic Computations	47	3.44	.55	48	3.11	.54	.33	.11	95	3.00	.005
Arithmetic Concepts	47	4.26	1.21	48	4.03	1.48	.23	.27	95	.85	NS
Arithmetic Applications	47	3.74	1.30	48	3.40	1.36	.34	.27	95	1.26	NS
Arithmetic Total	47	3.60	.70	48	3.28	.75	.32	.15	95	2.13	.025
Battery Total	47	3.64	.85	48	3.31	.96	.33	.18	95	1.83	.05

*Class of 1968--Children with two (2) years of pre-primary experience. Tested 10/70
Class of 1967--Children with one (1) year of pre-primary experience. Tested 5/69

TABLE 12

Means, Standard Deviations, Standard Error of Mean Difference, Degrees of Freedom, and Significance Values (t tests) for Arnold Third Grade Experimental Classes of 1967 and 1969* on Sub-tests and Total Battery Grade Equivalency Scores on Comprehensive Tests of Basic Skills, Level I**

Variable	Arnold* 67 N	X	SD	Arnold ## 69 N	X	X-X	S.D.	SEM_D	df	t	P
Reading Vocabulary	48	3.4	1.22	33	3.9	.5	1.52	.317	79	1.58	NS###
Reading Comprehension	48	4.1	2.01	33	4.4	.3	1.82	.429	79	.70	NS
Reading Total	48	3.6	1.40	33	4.1	.5	1.49	.328	79	1.52	NS
Language Mechanics	48	3.3	1.18	33	4.1	.3	1.17	.265	79	1.13	NS
Language Expression	48	3.9	1.36	33	4.4	.5	1.47	.368	79	1.36	NS
Language Spelling	48	3.6	1.21	33	3.9	.3	1.13	.262	79	1.15	NS
Language Total	48	3.6	1.23	33	4.1	.5	1.18	.271	79	1.85	.05
Arithmetic Computations	48	3.1	.54	33	3.5	.4	.42	.106	79	3.77	.0005
Arithmetic Concepts	48	4.0	1.42	33	4.1	.1	1.13	.290	79	.34	NS
Arithmetic Applications	48	3.4	1.36	33	3.7	.3	.97	.259	79	1.16	NS
Arithmetic Total	48	3.3	.75	33	3.6	.3	.53	.142	79	2.11	.025
Battery Total	48	3.3	.96	33	3.7	.4	.64	.173	79	2.25	.025

* Class of 1967 -- 1 year in pre-primary prior to entering first grade

Class of 1969 -- 3 years in pre-primary prior to entering first grade

** Tests administered at beginning of third grade

NS - Not significant

TABLE 13

Means, Standard Deviations, Standard Error of Mean Difference, Degrees of Freedom, Significance Values (t tests) for Arnold Third Grade Experimental Classes of 1968 and 1969* on Sub-tests and Total Battery Grade Equivalency Scores on Comprehensive Tests of Basic Skills, Level I **

Variable	Arnold * 68 N	X	SD	Arnold # 69 N	X	SD	X* - X**	SEM_D	df	t	I
Reading Vocabulary	47	3.8	1.43	33	3.9	1.52	.1	.337	78	.296	NS###
Reading Comprehension	47	4.1	1.36	33	4.4	1.82	.3	.373	78	.80	NS
Reading Total	47	3.9	1.26	33	4.1	1.42	.2	.317	78	.63	NS
Language Mechanics	47	4.1	1.46	33	4.1	1.17	.0	.294	78	0	NS
Language Expression	47	4.0	1.37	33	4.4	1.47	.4	.343	78	1.16	NS
Language Spelling	47	4.1	1.62	33	3.9	1.13	.2	.300	78	.65	NS
Language Total	47	4.0	1.28	33	4.1	1.18	.1	.277	78	.36	NS
Arithmetic Computation	47	3.4	.55	33	3.5	.42	.1	.108	78	.93	NS
Arithmetic Concepts	47	4.3	1.21	33	4.1	1.13	.2	.264	78	.76	NS
Arithmetic Applications	47	3.7	1.30	33	3.7	.97	.0	.253	78	0	NS
Arithmetic Total	47	3.6	.70	33	3.6	.53	.0	.137	78	0	NS
Battery Total	47	3.6	.85	33	3.7	.64	.1	.166	78	.60	NS

* Class of 1968 -- 2 years in pre-primary prior to entering first grade

Class of 1969 -- 3 years in pre-primary prior to entering first grade

** Tests administered at beginning of third grade

NS - Not Significant

TABLE 14

Means, Standard Deviations, Standard Error of Mean Difference, Degrees of Freedom, Significance Values (t tests) for Arnold Third Grade Experimental and Control Classes of 1969* on Sub-tests and Total Battery Grade Equivalency Scores on Comprehensive Tests of Basic Skills, Level I **

Variable	Arnold 69 E*			Arnold 69 C##			X* - X**	SEN_D	df	t	P
	N	X	SD	N	X	SD					
Reading Vocabulary	33	3.9	1.52	40	3.3	1.26	.6	.331	71	1.81	.05
Reading Comprehension	33	4.4	1.82	40	3.5	1.49	.9	.394	71	2.28	.025
Reading Total	33	4.1	1.49	40	3.3	1.26	.8	.327	71	2.45	.01
Language Mechanics	33	4.1	1.17	40	3.3	1.34	.8	.293	71	2.73	.005
Language Expression	33	4.4	1.47	40	3.6	1.90	.8	.394	71	2.02	.025
Language Spelling	33	3.9	1.13	40	3.3	1.20	.6	.273	71	2.20	.025
Language Total	33	4.1	1.18	40	3.3	1.34	.8	.295	71	2.71	.005
Arithmetic Computations	33	3.5	.42	40	3.0	.43	.5	.099	71	5.05	.0005
Arithmetic Concepts	33	4.1	1.13	40	3.6	1.41	.5	.297	71	1.65	.05
Arithmetic Applications	33	3.7	.97	40	3.1	1.34	.6	.270	71	2.22	.025
Arithmetic Total	33	3.6	.53	40	3.1	.62	.5	.134	71	3.73	.0005
Battery Total	33	3.7	.64	40	3.1	.87	.6	.177	71	3.39	.0005

*Experimental Class of 1969 -- 3 years in pre-primary prior to entering first grade

Control Class of 1969 - No pre-primary experience prior to entering first grade

** Tests administered at beginning of third grade

Table 15

Means, Standard Deviations, Standard Error of Mean Difference, Degrees of Freedom, and Significance Values (t tests) for Arnold Experimental Third Grade * and Selected Third Grade Students from Other Clayton County Schools** on Sub-tests and Total Battery Grade Equivalent Scores on Comprehensive Tests of Basic Skills, Level 1, Oct. 1969

Variable	Arnold* 1967 N	X	SD	West Clayton N	X	SD	X*-X**	SEMD	df	t	P
Reading Vocabulary	48	3.38	1.22	150	2.90	1.10	.48	.197	196	2.46	.02
Reading Comprehension	48	4.08	2.07	150	3.38	1.43	.70	.312	196	2.24	.05
Reading Total	48	3.50	1.48	150	3.00	1.20	.50	.225	196	2.23	.05
Language Mechanics	48	2.70	1.19	150	2.80	.92	-.07	.186	196	-.38	.0005
Language Expression	48	2.66	1.01	150	2.76	1.36	-.10	.187	196	-.53	.0005
Language Spelling	48	2.55	1.21	150	2.66	.80	-.11	.184	196	-.59	.0005
Language Total	48	2.62	1.02	150	2.96	.88	-.34	.167	196	-2.03	.05
Arithmetic Computation	48	3.11	.84	150	2.82	.56	.29	.100	196	2.90	.01
Arithmetic Concepts	48	4.03	1.46	150	3.16	1.00	.87	.209	196	4.16	.0005
Arithmetic Applications	48	3.40	1.36	150	2.84	.96	.56	.211	196	2.66	.01
Arithmetic Total	48	3.38	.75	150	3.06	.58	.32	.116	196	2.76	.01
Battery Total	48	3.37	.96	150	2.87	.73	.50	.150	196	3.33	.0005

*Class of 1967 - 1 year of Pre-Primary Experience

Table 16

Means, Standard Deviations, Standard Error of Mean Difference, Degrees of Freedom, and Significance Values (t tests) for Arnold Experimental Third Grades and Selected Third Grade Students from Other Dayton County Schools* on Sub-tests and Total Battery Grade Equivalency Scores on Comprehensive Tests of Basic Skills, Level 1, Oct. 1968

Variable	Arnold 1968 N	X	SD	Dayton## N	X	SD	X#-X##	SEDm	df	t	p
Reading Vocabulary	48	3.39	1.20	164	4.49	1.15	.75	.167	210	3.83	.0005
Reading Comprehension	48	4.47	2.43	164	3.68	1.49	1.80	.208	210	3.85	.0005
Reading Total	48	3.59	1.46	164	4.47	1.21	.88	.210	210	3.34	.0005
Language Mechanics	48	3.75	1.13	164	3.91	.98	.22	.154	210	1.45	.075
Language Expression	48	3.88	1.01	164	3.93	1.53	.05	.197	210	3.26	.005
Language Spelling	48	3.54	1.23	164	3.84	1.05	.30	.152	210	1.97	.025
Language Total	48	3.62	1.23	164	3.80	.93	.18	.118	210	1.57	.0625
Arithmetic Computation	48	3.33	.89	164	3.93	.45	.58	.084	210	7.01	.0005
Arithmetic Concepts	48	4.02	1.48	164	3.87	.94	1.30	.242	210	5.34	.0005
Arithmetic Applications	48	3.10	1.36	164	3.77	.98	.42	.213	210	3.02	.005
Arithmetic Total	48	3.29	.72	164	3.86	.54	.42	.114	210	3.42	.0005
Battery Total	48	3.27	.96	164	3.77	.75	.60	.151	198	3.94	.0005

*Class of 1967 - 1 year of Pre-Primary Experience
No Pre-Primary Experience

Table 17

Means, Standard Deviations, Standard Error of Mean Difference, Degrees of Freedom, and Significance Values (t tests) for Arnold Experimental Third Grade* and Selected Third Grade Students from Other Clayton County Schools** on Sub-tests and Total Battery Grade Equivalency Scores on Comprehensive Tests of Basic Skills, Level I, Oct. 1969

Variable	Arnold* 1967 N	X	SD	Fountain N	X	SD	$\bar{X}^*-\bar{X}^{**}$	SEM_D	df	t	P
Reading Vocabulary	48	3.38	1.22	66	1.65	.61	1.73	.191	112	9.05	.0005
Reading Comprehension	48	4.08	2.07	68	1.62	.63	2.46	.209	114	8.22	.0005
Reading Total	48	3.69	1.40	66	1.57	.57	2.02	.213	112	9.48	.0005
Language Mechanics	48	3.76	1.19	68	1.70	.49	2.06	.180	114	11.44	.0005
Language Expression	48	2.80	1.84	66	1.42	.50	2.42	.272	114	8.92	.0005
Language Spelling	48	3.55	1.23	68	1.91	.73	1.64	.195	114	8.43	.0005
Language Total	48	3.68	1.23	68	1.53	.56	2.09	.168	114	12.49	.0005
Arithmetic Computations	48	3.11	.54	62	2.34	.46	.77	.097	107	7.94	.0005
Arithmetic Concepts	48	4.13	1.48	61	1.78	.47	2.35	.232	107	10.18	.0005
Arithmetic Applications	48	3.40	1.36	61	2.22	.86	1.18	.221	107	5.33	.0005
Arithmetic Total	48	3.28	.75	61	2.11	.46	1.17	.122	107	9.59	.0005
Battery Total	48	3.32	.96	59	1.60	.54	1.71	.155	105	11.03	.0005

*Class of 1967 - 1 year of Pre-Primary Experience
**No Pre-Primary Experience

Table 18

Means, Standard Deviations, Standard Error of Mean Difference, Degrees of Freedom, and Significance Values (t tests) for Arnold Experimental Third Grades and Selected Third Grade Students from Other Clayton County Schools* on Sub-tests and Total Battery Grade Equivalency Scores on Comprehensive Tests of Basic Skills, Level I, Oct. 1970

Variable	Arnold* 1967 N	X	SD	Sudan N	X	SD	$\bar{X}_1 - \bar{X}_2$	$SE_{M_1 - M_2}$	df	t	p
Reading Vocabulary	48	3.38	1.22	152	2.60	1.13	.78	.198	198	3.94	.0005
Reading Comprehension	48	4.08	2.02	152	2.79	1.34	1.29	.309	198	4.17	.0005
Reading Total	48	3.59	1.40	152	2.63	1.15	.96	.222	198	4.32	.0005
Language Mechanics	48	3.74	1.18	152	2.74	1.05	1.00	.190	198	5.26	.0005
Language Expression	48	3.89	1.61	152	2.71	1.47	1.17	.227	198	5.16	.0005
Language Spelling	48	3.55	1.27	152	2.46	1.08	.83	.195	198	4.26	.0005
Language Total	48	3.69	1.33	152	2.64	1.09	.98	.198	198	4.95	.0005
Arithmetic Computations	48	3.31	.93	152	2.90	.91	.37	.087	198	3.77	.0005
Arithmetic Concepts	48	3.33	1.18	152	2.90	1.14	.43	.232	198	1.87	.0625
Arithmetic Applications	48	3.40	1.36	152	2.76	1.08	.64	.214	198	3.03	.005
Arithmetic Total	48	3.28	.75	152	2.77	.64	.50	.128	198	3.96	.0005
Battery Total	48	3.31	.94	152	2.54	.85	.76	.160	198	4.69	.0005

*Class of 1967 - 1 year of Pre-Primary Experience
Sudan - No Pre-Primary Experience

Table 19

Means, Standard Deviations, Standard Error of Mean Difference, Degrees of Freedom, and Significance Values (t tests) for Arnold Experimental Third Grade* and Selected Third Grade Students from Other Clayton County Schools** on Sub-tests and Total Battery Grade Equivalency Scores on Comprehensive Tests of Basic Skills, Level I, Oct. 1970

Variable	Arnold* N	X	SD	Fountain N	X	SD	$\bar{X}_1 - \bar{X}_2$	SEM_D	df	t	P
Reading Vocabulary	47	3.77	1.43	66	1.65	.61	2.12	.221	111	9.59	.0005
Reading Comprehension	47	4.14	1.36	68	1.62	.63	2.52	.212	113	11.88	.0005
Reading Total	47	3.88	1.26	66	1.70	.57	2.18	.196	111	11.12	.0005
Language Mechanics	47	4.32	1.46	68	1.62	.49	2.70	.220	113	12.27	.0005
Language Expression	47	3.96	1.57	68	1.91	.59	2.05	.234	113	8.76	.0005
Language Spelling	47	4.34	1.66	68	1.92	.73	2.61	.252	113	10.35	.0005
Language Total	47	3.97	1.38	68	2.34	.55	1.63	.198	113	8.23	.0005
Arithmetic Computations	47	3.44	.551	67	1.78	.44	1.66	.069	106	14.77	.0005
Arithmetic Concepts	47	4.26	1.21	63	1.78	.47	2.48	.186	106	13.32	.0005
Arithmetic Applications	47	3.74	1.30	63	2.12	.80	1.62	.214	106	7.53	.0005
Arithmetic Total	47	3.60	.701	63	2.11	.46	1.49	.117	106	12.74	.0005
Battery Total	47	3.61	.853	59	1.60	.54	2.04	.142	104	14.32	.0005

*Class of 1968--children with two (2) years of Pre-Primary Experience
**Fountain-3rd grade with no Pre-Primary Experience

Table 9*

Means, Standard Deviations, Standard Error of Mean Difference, Degrees of Freedom, and Significance Values (t Tests) for Arnold Experimental Third Grades** and Selected Third Grade Students from Other Clayton County Schools*** on Sub-tests and Total Battery Grade Equivalent Scores on Comprehensive Tests of Basic Skills, Level, Oct. 1970

Variable	Arnold* 1968 N	M	SD	Sudow N	M	SD	X̄₁-X̄₂	SEM	df	t	p
Reading Vocabulary	47	3.27	1.12	61	2.71	1.06	1.06	.247	106	4.29	.0001
Reading Comprehension	47	4.34	1.26	62	3.86	1.41	1.24	.266	107	4.71	.0001
Spelling Total	47	3.80	1.24	62	3.23	1.25	1.15	[illegible]	[illegible]	[illegible]	[illegible]
Language [illegible]	47	4.22	1.16	62	3.62	1.36	1.07	.253	106	4.26	.0001
Language Expression	47	3.26	1.32	62	2.74	1.49	.89	.254	106	3.50	.0007
Mathematics Concepts	47	4.21	1.48	62	3.27	1.33	1.37	.277	108	4.93	.0001
Mathematics Total	47	3.77	1.26	62	3.03	1.24	1.41	.251	106	4.91	.0001
Study Skills Graphs	47	3.44	.82	62	3.24	.78	.19	.230	106	1.59	.1151
Mathematics Computation	47	4.46	1.42	62	3.33	1.13	1.13	.226	106	4.99	.0001
Mathematics Applications	47	3.87	1.21	62	3.22	1.23	.65	.230	106	2.83	.0054
Mathematics Total	47	2.60	.72	62	2.34	.77	.21	.136	107	1.91	.0588
Battery Total	47	3.67	.91	62	3.24	.99	.43	.167	107	2.57	.0116

*Mean [illegible] - 2 years in Arnold

**All 3rd grade - Dr. M. [illegible] Experiment

Table 21

Means, Standard Deviations, Standard Error of Mean Difference, Degrees of Freedom, and Significance Values (t tests) for Arnold Experimental Third Grade* and Selected Third Grade Students from Other Clayton County Schools** on Sub-tests and Total Battery Grade Equivalency Scores on Comprehensive Test of Basic Skills, Level, Oct. 1970

Variable	Arnold* N	X	SD	West Clayton N	X	SD	A*-X**	SEM_D	df	t	P
Reading Vocabulary	47	3.77	1.43	143	3.04	.98	.73	.224	188	3.25	.005
Reading Comprehension	47	4.34	1.36	143	3.24	1.22	.20	.223	188	4.04	.0005
Reading Total	47	3.88	1.26	143	3.10	1.00	.78	.222	188	3.51	.0005
Language Mechanics	47	4.12	1.46	143	3.19	1.23	.93	.236	188	3.94	.0005
Language Expression	47	3.96	1.57	143	3.00	1.24	.96	.242	188	3.97	.0005
Language Spelling	47	4.14	1.62	142	3.21	1.11	.93	.253	187	3.68	.0005
Language Total	47	3.97	1.28	142	3.07	1.02	.90	.205	187	4.39	.0005
Arithmetic Computations	47	3.44	.55	139	3.22	.56	.22	.092	184	2.39	.02
Arithmetic Concepts	47	4.26	1.21	139	3.28	1.13	.98	.20	184	4.90	.0005
Arithmetic Applications	47	3.74	1.30	135	2.91	1.05	.83	.209	180	3.97	.0005
Arithmetic Total	47	3.60	.70	135	3.17	.66	.43	.136	180	3.71	.0005
Battery Total	47	3.64	.85	132	3.00	.77	.64	.14	177	4.57	.0005

*Class of 1968--children with two (2) years of pre-primary experience

Table 22

Means, Standard Deviations, Standard Error of Mean Difference, Degrees of Freedom, and Significance Values (t tests) for Arnold Experimental Third Grade* and Selected Third Grade Students from Other Clayton County Schools** on Sub-tests and Total Battery Grade Equivalency Scores on Comprehensive Tests of Basic Skills, Level I, Oct. 1970

Variable	Arnold* N	X	SD	Huie N	X	SD	X*-X**	SEM_D	df	t	P
Reading Vocabulary	47	3.77	1.43	77	2.86	1.21	.91	.250	122	3.64	.0005
Reading Comprehension	47	4.14	1.36	77	3.23	1.63	.91	.271	122	3.36	.0005
Reading Total	47	3.88	1.26	77	2.98	1.33	.90	.238	122	3.78	.0005
Language Mechanics	47	4.12	1.46	77	2.91	1.04	1.21	.243	122	4.98	.0005
Language Expression	47	3.96	1.47	77	2.98	1.35	.98	.275	122	3.56	.0005
Language Spelling	47	4.14	1.62	77	2.84	1.16	1.30	.270	122	4.81	.0005
Language Total	47	3.97	1.28	77	2.83	1.01	1.14	.219	122	5.20	.0005
Arithmetic Computations	47	3.44	.55	79	2.89	.51	.55	.098	124	5.60	.0005
Arithmetic Concepts	47	4.26	1.21	79	2.86	.96	1.40	.213	124	6.63	.0005
Arithmetic Applications	47	3.74	1.30	78	2.97	1.00	.75	.220	123	4.54	.0005
Arithmetic Total	47	3.60	.70	78	2.86	.62	.74	.123	123	5.04	.0005
Battery Total	47	3.64	.85	76	2.76	.81	.88	.154	121	5.71	.0005

*Class of 1968--children with two (2) years of pre-primary experience

Clayton County Board of Education

ANALYSIS OF EXPENDITURES
(Federal)

Early and Continuous Stimulation of Children 3-9 Years of Age
Fiscal Year 1970-71

INSTRUCTION	
3 Teachers	$20,562.67
1/2 Teacher*	4,439.94
8 Teacher aides @ $2924.10	23,392.80
FIXED CHARGES	
Teachers	
Retirement 7.65% X $20,199.62	1,912.70
Insurance 3 & 1/2 X $72.00	252.00
Sick Leave 3 & 1/2 X $50.00	175.00
Teacher Aides	
Retirement 5.2% X $23,392.80	1,216.43
TOTAL	$51,951.54

* Balance paid by Clayton County Board of Education

Clayton County Board of Education

ANALYSIS OF EXPENDITURES
(Federal)

Early and Continuous Stimulation of Children 3-9 Years of Age
Fiscal Year 1971-72

INSTRUCTION	
1 Teacher	$ 7,539.96
1/2 Teacher *	4,559.94
4 Teacher Aides @ $2924.10	11,696.40
FIXED CHARGES	
Teachers	
Retirement 7.65% x 12,099.90	925.64
Insurance 1 & 1/2 x $96.00*	144.00
Sick Leave 1 & 1/2 x $50.00	75.00
Teacher Aides	
Retirement 5.2% x 11,696.40	608.21
TOTAL	$25,549.15

Clayton County Board of Education

ANALYSIS OF EXPENDITURES (SUMMARY)
(Federal 1970-1972)

Early and Continuous Stimulation of Children 3-9 Years of Age

INSTRUCTION	$72,191.71
FIXED CHARGES	5,308.98
TOTAL	$77,500.69*

* Amount of Grant	$73,000.00
Expended	$77,500.69
Over expended	$4,500.69